CLAIMS

1. A catalyst composition comprising crystallites of catalytically active palladium or palladium and at least one metal of Group VIII of the Periodic Table of Elements, applied to the surface of a carbon material, wherein a mesoporous graphite-like material with the average mesopore size in the range of from 40 to 400 Å, the proportion of the mesopores in the total pore volume of at least 0.5, and the degree of graphite-similarity of at least 20% is used as the carbon material, in which metal crystallites are distributed in the volume of the carbon material granules in such a manner that the distribution peaks of these crystallites should be at a distance from the outer surface of the granule corresponding to 1—30% of its radius.

2. The catalyst composition of claim 1, characterized in that it comprises crystallites of rhodium and palladium.

3. The catalyst composition of claim 1, characterized in that it comprises crystallites of palladium and ruthenium.

4. The catalyst composition of claim 1, characterized in that it comprises crystallites of palladium and platinum.

5. The catalyst composition of claim 1, characterized in that the total content of metals therein varies within the range of from 0.1 to 3.0 percent by weight.

6. The catalyst composition of claim 1, characterized in that the weight ratio of palladium to other metals varies within the range of from 0.1 to 10.0.

7. A method of preparing a catalyst composition for the purification of terephthalic acid by applying catalytically active palladium or palladium and at least one of Group VIII metals to the surface of granules of a carbon carrier, said granules being contacted with an aqueous solution of palladium salts or palladium salts and salts of at least one of Group VIII metals to produce a "metal salt - porous carbon" precursor, wherein the precursor is dried and treated with a reducing agent in an amount sufficient for reducing the surface metal salts to the

metal crystallites, characterized in that a mesoporous graphite-like material with the average mesopore size in the range of from 40 to 400 Å, the proportion of the mesopores in the total pore volume of at least 0.5, and the degree of graphite-similarity of at least 20% is used as the carbon material to produce a metallic or bimetallic catalyst.

8. The method of claim 7, characterized in that said catalyst composition is prepared, using one of the following metal precursors:

H_2PdCl_4 or $Pd(NO_3)_2$;

H_2PdCl_4 and $RuOHCl_3$ or $RuNO(NO_3)_3$;

$Pd(NO_3)_2$ and $RuOHCl_3$ or $RuNO(NO_3)_3$.

9. The method of claim 7, characterized in that said catalyst composition is prepared, using nitric acid solutions of palladium and/or ruthenium salts with the concentration of free nitric acid ranging from 37 to 170 g/l.

10. The method of claim 7, characterized in that bimetallic catalysts are prepared by combined application of metal precursors.

11. The method of claim 7, characterized in that bimetallic catalysts are prepared by successive application of metal precursors.

12. A method of purifying terephthalic acid from p-carboxybenzaldehyde in the presence of hydrogen with the use of a catalyst composition which comprises crystallites of catalytically active palladium or of palladium and at least one metal of Group VIII of the Periodic Table of Elements, applied to the surface of carbon material, characterized in that in the catalyst composition a mesoporous graphite-like material with the average mesopore size in the range of from 40 to 400 Å, the proportion of the mesopores in the total pore volume of at least 0.5, and the degree of graphite-similarity of at least 20% is used as the carbon material, wherein the metal crystallites are distributed within the volume of granules of the carbon material in such a manner that peaks of the distribution of active components

should be should be at a distance from the outer surface of the granule corresponding to 1–30% of its radius.

13. The method of claim 12, characterized in that the catalyst composition comprises crystallites of palladium and rhodium.

14. The method of claim 12, characterized in that the catalyst composition comprises crystallites of palladium and ruthenium.

15. The method of claim 12, characterized in that the catalyst composition comprises crystallites of palladium and platinum.

16. The method of claim 12, characterized in that the total content of metals in the catalyst composition varies within the range of from 0.1 to 3.0 percent by weight.

17. The method of claim 12, characterized in that the weight ratio of palladium to other metals in the catalyst composition varies within the range of 0.1 to 10.0.

18. The method of claim 12, characterized in that the concentration of p-carboxybenzaldehyde in terephthalic acid to be purified varies from 1000 to 30000 ppm.

ADD A1

Catalyst Composition, Method for Preparing thereof, and Method for Purifying Terephthalic Acid

Sub A2

ABSTRACT

The present invention relates to catalyst compositions for purifying terephthalic acid, based on Group VIII metals, to methods for preparing thereof, and to a method of purifying terephthalic acid suitable for the subsequent synthesis of polyester polymers and copolymers used in the manufacture of textile fibers.

The present invention solves the problem of providing selective and stable catalysts and processes wherein crude terephthalic acid with a high initial content of p-carboxybenzaldehyde should be selectively hydrogenated into p-toluic acid or/and decarbonylated into benzoic acid with a low residual content of p-carboxybenzaldehyde.

Said problem is solved by using in a method for the purification of terephthalic acid a catalyst composition comprising crystallites of catalytically active palladium or of palladium and at least one metal of Group VIII of the Periodic Table of Elements, applied to the surface of a carbon material, wherein a mesoporous graphite-like material with the average mesopore size in the range of from 40 to 400 Å, the proportion of the mesopores in the total pore volume of at least 0.5, and the degree of graphite-similarity of at least 20% is used as the carbon material, in which metal crystallites are distributed in the volume of the carbon material granules in such a manner that the distribution peaks of these crystallites should be at a distance from the outer surface of the granule corresponding to 1—30% of its radius.

The catalyst composition comprises crystallites of palladium and rhodium or of palladium and ruthenium, or of palladium and platinum, the total content of the metals varying within 0.1 to 3.0 percent by weight and the weight ratio of palladium to other metals varying within 0.1 to 10.0.